

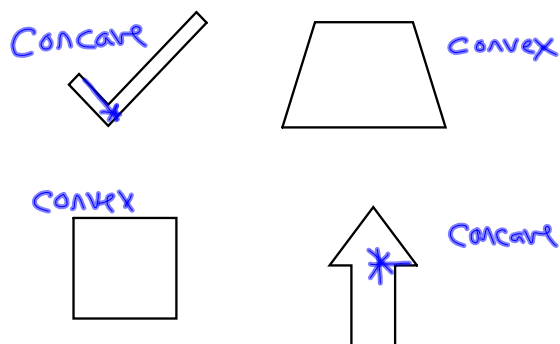
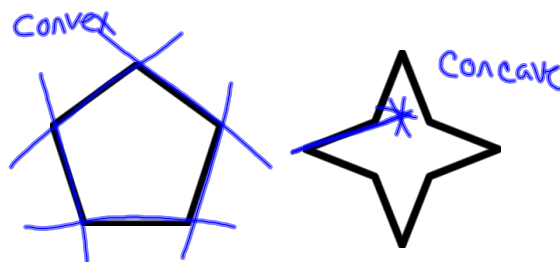
Chapter 8

Polygons and Area

8-1 Classifying Polygons

Convex--A polygon is convex, if the line containing a side does not pass through the interior of the polygon

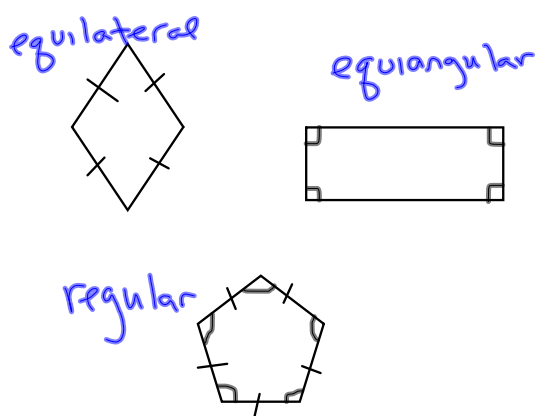
Concave--Not convex



Equilateral--all sides congruent

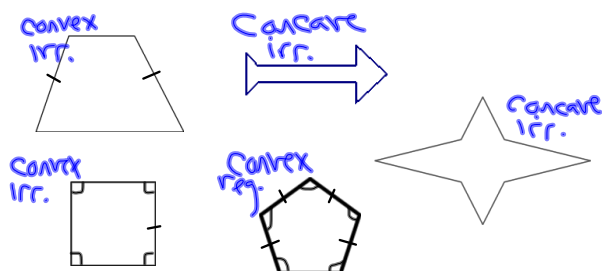
Equiangular--all angles congruent

Regular--both equilateral and equiangular



Classify the following figures as:

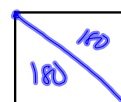
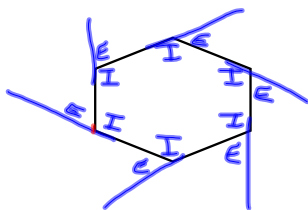
- convex or concave
- regular or irregular



8-2 Angles of a Polygon

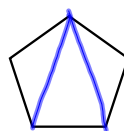
Interior angles

Exterior angles

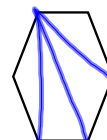


$$2 \cdot 180 = 360^\circ$$

$$\begin{matrix} 4 & 5 & 6 & n \\ 2 & 3 & 4 & n-2 \end{matrix}$$



$$3 \cdot 180 = 540^\circ$$



$$4 \cdot 180 = 720^\circ$$

Theorem 8.1--Polygon Interior Angles Theorem

The sum of the measures of the interior angles of a convex polygon with n sides is $(n-2)180$.

$$(n-2)180 = \text{sum of int. } \angle s$$

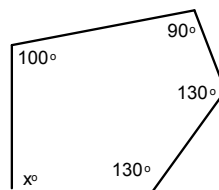
Find the sum of interior angles for:

$$n = 7$$

$$(7-2)180 = 900^\circ$$

$$n = 15$$

$$(15-2)180 = 2340^\circ$$

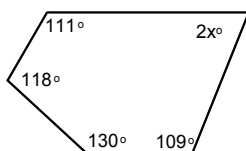
Find x .

$$\text{Find total } (5-2)180 = 3 \cdot 180 = 540$$

$$x + 100 + 90 + 130 + 130 = 540$$

$$x + 450 = 540$$

$$x = 90$$

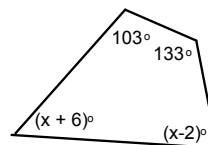


$$2x + 111 + 118 + 130 + 109 = 540$$

$$2x + 468 = 540$$

$$2x = 72$$

$$x = 36$$



$$(4-2)180 = 360$$

$$(x+6) + (x-2) + 133 + 103 = 360$$

$$2x + 240 = 360$$

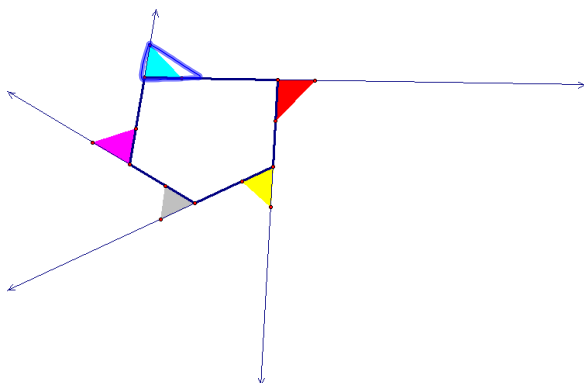
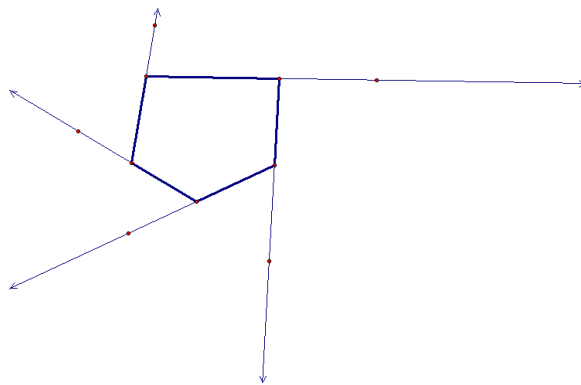
$$2x = 120$$

$$x = 60$$

Find each interior angle of a regular:

a. pentagon $(5-2)180 = 540^\circ$
 $\frac{540}{5} = 108^\circ$

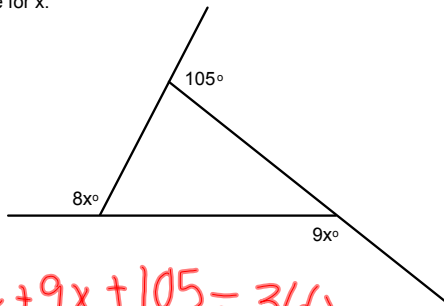
b. 12-gon
 $(12-2)180 = 1800$
 $\frac{1800}{12} = 150^\circ$



Theorem 8.2 The Polygon Exterior Angles Theorem--
 The sum of the measures of the exterior angles of a
 convex polygon is 360°.

always 360°

Solve for x.



$$8x + 9x + 105 = 360$$

$$17x + 105 = 360$$

$$17x = 255$$

$$x = 15$$

HW

p413-414 7-17

p421 11, 12, 14, 17, 20, 21, 25